The Effects of the Nutrition Lottery Draw Game to Increase Nutrition Knowledge

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Abstract

A good generation must be created through effort and real work. One generation is a group of schoolchildren who are the nation's investment. A complete generation must be supported by good nutrition. In order to fulfill good food ingredients, of course, it requires proper nutritional knowledge. This study aims to determine the effect of the nutrition lottery draw game media on increasing nutritional knowledge in elementary school children. The research design used a quasi-experimental design (Non-Randomized group pre-test post-test) with research subjects of as many as 48 children divided into 2 (two) treatment groups (each group consisting of 24 people). The subjects of the study employed the students in Elementary School 17 and 20 Siantan, Jungkat District, Mempawah Regency in March 2021. Data analysis with Wilcoxon test and Man-Whithney. Furthermore, the intervention was carried out for one month effectively and divided into 2 (two) groups, namely, one group was provided games treatment and one group had no treatment. There were differences in knowledge scores before and after the intervention in the control and treatment groups. There was no difference in the increase of knowledge scores in the treatment and control groups.

Keywords: Games, Nutritional Knowledge, Schoolchildren

INTRODUCTION

The prevalence of stunting in children under five in Indonesia is higher than the prevalence of stunting in the world (Hidayat, 2022). One of the impacts of stunting is the occurrence of developmental barriers, where if this is not prevented it will have an impact on the less than optimal performance of children in school and the long-term impact can be a decrease in the quality of human resources (Ghosh, 2016; Savitri, 2020; Sukmawati et al., 2023). The prevalence of stunting globally based on the report of the United Nations in 2018 is 22.2% or 150 million children under five worldwide. Reducing stunting of children aged 0–59 months is the first goal of the six global nutrition development goals by 2025 and is targeted to reduce stunting by 40% of the total number of stunting. Stunting prevalence data collected by the World Health Organization, Indonesia is included in the third country with the highest prevalence in Southeast Asia/South-East Asia Regional. The average prevalence of stunting infants in Indonesia in 2005–2017 was 36.4% (Wahyuningsih et al., 2022).

In Indonesia, most of the 34 provinces showed a decrease compared to 2019 and only 5 provinces showed an increase. This shows that the implementation of government policies to accelerate the reduction of stunting in Indonesia has yielded quite good results. The top 10 provinces with stunting, namely East Nusa Tenggara (NTT), are listed as the province with the highest national stunting rate in 2021. SSGI recorded that 37.8% or 1 out of 3 toddlers in NTT was stunted. The province with the next highest stunting rate is West Sulawesi, which is 33.8%. Followed by Aceh 33.2%, West Nusa Tenggara (NTB) 31.4%, and Southeast Sulawesi 30.2%, South Kalimantan with a stunting rate of 30%, West Kalimantan 29.8%, Central Sulawesi 29.7%, and Papua and Gorontalo 29.5% and 29% respectively (BPS-Statistics Indonesia, 2021).

Elementary school children are a strategic target in improving community nutrition (Hasrul et al., 2020). The school children are a human resource who will continue development in Indonesia (Judarwanto, 2015). As the next generation, of course, the quality must be improved regarding health and intelligence level (Arfines &; Puspitasari, 2017). In order to support the conditions mentioned above, it requires optimal and fit body conditions, so they require good nutritional status (El-Kour et al., 2021; Freedman, 2020).

Failure to meet nutrition from food will cause growth and development failure (Hastuty, 2020). This problem is often referred to as stunting to describe short stature or abnormal growth (Rahmadi *et al.,* 2015). Based on *Riskesdas* 2010 data analysis results, the prevalence of stunting children in school-age children (6-12 years) in Indonesia was 35%. Based on *Riskesdas* 2013 data, it was found that the prevalence of stunting of school-age children (6-12 years) in Indonesia was 30.7%. It can be seen that there is a decrease in stunting rates, but the problem of stunting is still high (Sasmita, 2021; Syukur & Harismayanti, 2020).

This high prevalence of stunting needs more attention from all parties because many stunting are associated with poor school achievement and low cognitive ability compared to children who are not stunted (Arbie & Labatjo, 2019; Syukur & Harismayanti, 2020). The results of other studies mentioned that stunting is related to emotional factors. The prevalence of emotional and behavioral problems that occur in children with short stature is higher than the prevalence of emotional and behavioral problems in the normal child population (Arfines &; Puspitasari, 2017).

Efforts to overcome the problem of stunting have been conducted a lot. These efforts involve the maintenance and improvement of public health carried out through programs to improve healthy living behaviour, maintenance of a healthy environment, and effective public health services and supported by reliable observation, as well as information and management

systems (Ministry of Health of the Republic of Indonesia, 2018). Appropriate media are needed for their mental and social development to make the program able to reach school children.

One factor that influences eating habits is nutritional knowledge (Judarwanto, 2015). School-age children have a habit of snacking. Snacking habits are part of the culture of the family. Fast food that does not meet health and nutrition requirements will threaten children's health. Children's appetite decreases and it will affect nutritional status if it lasts a long time (Susanto, 2003 in Rivani, Zain, & Indah, 2015)

Children's nutritional knowledge is very influential on the selection of snack food (Rivani *et al.,* 2015). The child's knowledge can be acquired both internally and externally. Internal knowledge comes from oneself based on life experience, while externally, the knowledge that comes from others, so that children's knowledge about nutrition can increase (Anto et al., 2017; Boh & Richard, 2019; Rachmad et al., 2023).

Moreover, game media is very suitable in the introduction of balanced nutrition in school-age children because childhood is experiencing a period of play and they also begin to learn to make their own decisions at this time children. Thus, providing knowledge through games will be very an effective way to increase knowledge about balanced nutrition (Afifah *et al.,* 2010). The goal of the game lies in the game itself and is achieved at playtime (Chang et al., 2022; Hermans et al., 2018). Play activity is different from work. Work has the further purposes, the goal is achieved after the work is completed. Children like to play because there is an inner drive and encouragement to develop themselves (Chang et al., 2022).

This research developed a lottery draw game that is commonly played by children. Participants randomly picked the number that had been provided and then matched it with the meaning and prizes that have been provided. This game is interesting because children always have the opportunity to get unexpected rewards and nutrition meaning it will be easier to deliver because find in its game situation. This study aims to determine the effect of the nutrition lottery draw game media on increasing nutritional knowledge in elementary school children.

METHODS

The method used quasi-experimental research (*Non-randomized group pre-test post-test*) (Sugiyono, 2019) with research subjects as many as 48 children divided into 2 (two) treatment groups (each group consisting of 24 people). The subjects of the study were the students in Elementary School 17 and 20 Siantan, Jungkat District, Mempawah Regency in March 2021. Furthermore, the intervention was carried out for one month effectively and divided into 2 (two) groups, namely, 1 (one) group provided games treatment and 1 (one) group

had no treatment. The treatment group was provided a lottery draw game, which was a modified as a lottery game. One person revoked the lottery number, then matched it with the prepared nutrition message number. Children read the messages or meaning until they understand, and then they must understand other friends. If the theme had been understood, the child will exchange the lottery for the prize provided. Data analysis used a difference test between two groups of paired samples to determine the difference in knowledge values before and according to treatment. After conducting the normality test, abnormal data results were obtained. Thus, it was decided to use the Wilcoxon test and the Man-Whithney statistical test for the not match data

RESULTS

State Elementary School 20 and 17 Siantan are the schools located in one sub-district, namely Siantan District. State Elementary School 20 Siantan is located in St. Raya Wajok, Wajok Hulu, Sub-district. Siantan, Pontianak, West Kalimantan 78351, while State Elementary School 17 is located in Wajok Hulu Village, Sub-district, Siantan, Pontianak, West Kalimantan 78351. The following data in Table 1 presents an overview of respondents by gender. Overall, respondents were mostly male students.

Table 1. Overview of Number of Respondents in Control Group and Treatment by Gender

Gender	Control		Treatment		Sum		p*
	n	%	n	%	n	%	
Male	13	52,0	12	48,0	25	100,0	0,773
Female	11	47,8	12	52,2	23	100,0	
	24	50,0	24	50,0	48	100,0	
Age							
10 Years	13	81,3	3	18,8	16	100,0	
11 Years	9	50,0	9	50,0	18	100,0	
12 Years	2	20,0	8	80,0	10	100,0	0,003
13 Years	0	0	4	100,0	4	100,0	
Sum	24	50,0	24	50,0	44	100,0	

Based on *Chi Square's* statistical test, it was stated that there was no difference in gender proportion in the control and treatment groups. However, there is a difference in the proportion of age groups.

Table 2. Statistical Discrepancy of Student Knowledge Scores in Control Group

Description of Statistics	Pre-Scores	Post-Scores	Difference
Mean	12,0	15,0	3,0
Std, Deviation	1,8	1,9	0,1
Minimum	9	12	3
Maximum	14	18	4

Table 2 explains that the average value of knowledge before intervention in the control group increased by three points. Before treatment is 12 and after treatment is 15. Minimum and maximum scores have also increased. However, there is an increase in standard deviation. This indicates that the data is increasingly inhomogeneous.

Table 3. Discrepancy in the Ranking of Student Knowledge Scores in the Control Group

Ranking	N	Mean Rank	Sum of Ranks
Negative Ranks	0[a]	0,00	0,00
Positive Ranks	18[b]	9,50	171,00
Ties	6[c]		
Total	24		

Table 3 is a grouping of knowledge data ranking scores. The analysis of the numbers listed in the table is that there is no decreased score, as many as eighteen respondents experienced an increase in score and six respondents have fix scores. The results of the Wilcoxon test analysis showed that there were differences in knowledge scores in the before and after groups in the control group.

Table 4 .Statistical Description of Student Knowledge Scores in Treatment Group

Description of Statistics	Pre-Score	Post-Score	Difference
Mean	12,2	14,1	1,9
Std, Deviation	1,3	0,9	-0,4
Minimum	10	12	2
Maximum	15	16	1

Table 4 shows an average increase of 1,9 points and a decrease of 0,4 for standard deviation. Maximum and minimum scores also increased.

Table 5 Description in the Ranking of Student Knowledge Scores in the Treatment Group

Ranking	N	Mean Rank	Sum of Ranks
Negative Ranks	0[a]	0,00	0,00
Positive Ranks	20[b]	10,50	210,00
Ties	4[c]		
Total	24		

Table 5 is a grouping of knowledge data ranking values. The analysis of the numbers listed in the table is that there is no decreased value, as many as 20 respondents have increased in value and 4 respondents have fixed scores. The results of the Wilcoxon test analysis showed that there were differences in knowledge scores in the group before and after the intervention.

Table 6. Statistical Discrepancy of Student Knowledge Scores

Description of Statistics	Control	Treatment	Difference
Mean	1,9	3,5	1,6
Std. Deviation	1,4	2,7	1,3
Minimum	0	0	0
Maximum	4	8	4

Table 6 shows some increases of 1,1 points and an in maximum value. There is a greater difference than the standard deviation in the treatment group. It can be seen in the Table 6 that the mean rank of the control and treatment groups is relatively small. There are no results of *Umann Whitney's* analysis found in a statistical difference (p = 0,281).

DISCUSSION

The implementation of a game has no specific purpose. Its goal lies in the game itself and is achieved at playtime (Khobir, 2009). Meanwhile, the game can be used as an educational medium if educational materials are given in the game. All materials can be used as games, as long as they do not interfere with the purpose of playing.

The lottery draw game is a modification of children's games in which basically children buy lottery numbers then the numbers are matched with prizes. There are many local names in terms of lottery, such as toy lottery coupons, lottery revoke, lottery revoke or draw prizes. The prizes provided vary, starting from toys, foods, or stationery.

Many parents forbid children to buy this toy because it contains a kind of gambling. In this study, there is no longer an element of gambling. That there is indeed a raffle, but only to issue a hidden nutritional meaning and must be read by participants. The reading of the meaning must be loud and audible to the friends because they will repeat the nutrition meaning. If something goes wrong, the reader must repeat the meaning until the friends becomes understood. If they can answer correctly, the prize is given.

The core of the game is to repeat the meaning, so that the meaning becomes easier to arrive and become understood as the correct nutrition meaning because it is often conveyed will make the meaning reach the audience (Wijaya, 2015). In some children, even the meaning must be repeated more because the child's ability to understand the meaning is not the same.

The control in this study was a child who was explained through Powerpoint media. The presenter reads the message or meaning as if an extension worker gives counseling. In this process, children showed their changing interests. This means that sometimes there is attention, but sometimes it is reduced. Of course, the role of extension workers is very important to keep children's interest or attention that must be maintained (Suci, 2019).

These two methods show that children independently maintain interest or attention in the game through the lottery draw games. While in the lecture technique, the teacher must remind the children to stay focused on understanding the material. In other words, although children focus on playing the lottery, their focus is on something other than the material. They are enjoyed in the game and hoped for the prizes obtained. The results of statistical analysis from both methods showed differences in before and after scores. When viewed from the average increase, the game method has a higher improvement value than the control (Powerpoint media) group. However, this game provides more benefits because the game is basically independent. Even if the game has become a child's favorite, then they will do without the help of a tutor. Children will manage their own games and teach their fellow friends to get other friends to play.

Therefore, game for children is a form of fun activity that is done solely for the activity itself, not because it wants to obtain a result from the activity. This is because children think that the process of doing something is more interesting than the results that will be obtained. (Pure, 2017). Several educational studies that compared the game with conventional methods, it turns out that the game method has a better improvement. In the board game study, there was an increase in the nutritional knowledge score which was greater than using poster media. In board games, it increased by 25.4, while the use of posters increased by 18.5 (Trianasari et al., 2018).. In addition to an increase in higher knowledge, education with media games can also increase interest in learning in children (Chusniyah et al., 2016).

The essence of the game is to repeat messages and be stimulated with gifts. The process of repetition is something that is very important in order to strengthen memory. This concept was put forward by Atkinson and Shiffrin in the theory of multistore memory in 1968. According to this theory, repetition allows information to be processed further and can be transferred to long-term memory (Malmberg, Raaijmakers, & Shiffrin, 2019. In repetition also occurs the process of matching (encoding). Based on Craik and Lockhart's theory in 1972, encoding refers to the information processing process that occurs when information is transferred from the environment into memory. Encoding can occur in various ways, including repetition, organizing information, and giving meaning to that (Jaenudin & Sahroni, 2021).

A study using puzzles to improve the concept of numbers, it turns out that the results in the second cycle were better than the first cycle (Amalia et al., 2019). In another study, nutrition education using Nutriedutainment media turned out to increase knowledge of balanced nutrition in elementary school children (Mohammadi et al., 2022).

Repeated measurements of three measurements (before the intervention, 3, and 6 months after the intervention) in the intervention and control groups showed that there was a significant relationship between the scores and the groups in the total health belief score. Other research shows that there is an increase in adherence to treatment, quality of life, and health knowledge in the four intervention periods (Mohammadi et al., 2022).

Social cognitive theory, developed by Albert Bandura, emphasizes the important role of environmental influences and cognitive processes in children's learning and development. According to this theory, children learn through observing, imitation, and modeling the behavior of others in their environment. In the context of gift giving, children can observe and pay attention to how adults or their peers are given gifts in recognition of their achievements or efforts. This can influence their perception of the importance of learning and effort, and motivate them to achieve the desired results (Huda & Maemonah, 2022).

CONCLUSIONS

Based on the explanation above, the lottery dram game is a favorite game, especially for the children in elementary schools. It gives differences score for the both groups. There are some differences in knowledge scores before and after the intervention in the control group. Besides, there were differences in the value of knowledge before and after the intervention in the treatment group. Then, there was no difference in the increase in knowledge scores in the treatment and control groups. This game can be implemented during learning to increase children's interests and motivation in learning new terms.

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